



# PHOTOVOLTAIC (PV) SUBMITTAL CHECKLIST

Pennsylvania Uniform Construction Code (UCC) referencing the IRC and/or IBC & NEC  
as adopted by Manheim Township Ordinance. This checklist is based on the 2020 NEC

## ROOF ATTACHMENT INFORMATION

### ☐ SITE SPECIFIC ENGINEERING SUBMITTED UNDER SEAL & SIGNATURE OF DESIGN PROFESSIONAL

- ☐ Rack System manufacturer installation guidelines & specifications provided
- ☐ Verification that existing roof system(s) is adequate for the proposed roof mounted photovoltaic system
- ☐ Design assumptions provided to include applicable loads, roof type, roof slope and connection details
- ☐ Attachment methods including type, size and spacing of fasteners provided in engineering

## WIRING DIAGRAM

### ☐ SITE SPECIFIC SINGLE LINE ELECTRICAL DIAGRAM

The Single Line Diagram is to include the following:

- ☐ System kW rating \_\_\_\_\_ ☐ Stand Alone System ☐ Utility Interactive System ☐ Storage batteries
- ☐ Number of modules in series \_\_\_\_\_ ☐ Number of parallel source circuits \_\_\_\_\_ ☐ Total number of modules \_\_\_\_\_
- ☐ Microinverters ☐ # of microinverters on each branch circuit ☐ total length of ac home run circuit(s)
  - ☐ **Circuit #1**, # of inverters \_\_\_\_\_ homerun length \_\_\_\_\_ ☐ **Circuit #2**, # of inverters \_\_\_\_\_ homerun length \_\_\_\_\_
  - ☐ **Circuit #3**, # of inverters \_\_\_\_\_ homerun length \_\_\_\_\_ ☐ **Circuit #4**, # of inverters \_\_\_\_\_ homerun length \_\_\_\_\_
- ☐ Combiner/junction box is identified & type/listing information noted
- ☐ Wiring method(s) and sizes between array and combiner/junction identified
- ☐ Overcurrent protection required with **3 or more parallel strings**
- ☐ **Equipment grounding** method and wiring type/size identified
- ☐ The PV **dc disconnect** is identified – 60 amp rated per NEC 230.79(D). **Manufacturer/Model #** \_\_\_\_\_  
(If fused disconnect required, identify dc rating, voltage, current & interrupt rating) NEC 690.9(C)
- ☐ Wiring method(s) and sizes between combiner/junction and UL1741 inverter identified
- ☐ Inverter manufacturer, size and ratings provided
- ☐ Wiring method(s) and sizes between inverter/AC disconnect/house disconnect or panel identified
- ☐ Point of connection identified. If load side connection, circuit breaker size(s) \_\_\_\_\_ Breaker to match panel type
- ☐ The **ac disconnect** is identified – 60 amp rated per NEC 230.79(D). **Manufacturer/Model #** \_\_\_\_\_
- ☐ **Premise grounding** method and wiring type/size identified. Fully compliant ac grounding required per NEC 250.50

## INVERTER INFORMATION **Manufacturer/Model#** \_\_\_\_\_

### ☐ MANUFACTURER'S SPECIFICATIONS, LISTING INFORMATION & APPLICABLE RATINGS

- ☐ UL 1741 listed equipment & identified for use in interactive Photovoltaic Power Systems
- ☐ Continuous output power & input voltage range of inverter provided

## PV MODULE INFORMATION **Manufacturer/Model#** \_\_\_\_\_

### ☐ MANUFACTURER'S SPECIFICATIONS, LISTING INFORMATION & APPLICABLE RATINGS

- |                                                                   |                                                        |
|-------------------------------------------------------------------|--------------------------------------------------------|
| <input type="checkbox"/> _____ Open-circuit voltage (Voc)         | <input type="checkbox"/> _____ Max Power (Pmax) at STC |
| <input type="checkbox"/> _____ Maximum permissible system voltage | <input type="checkbox"/> _____ Voltage at Pmax         |
| <input type="checkbox"/> _____ Short-circuit current (Isc)        | <input type="checkbox"/> _____ Current at Pmax         |
| <input type="checkbox"/> _____ Maximum series fuse rating         |                                                        |

## ARRAY INFORMATION *(Not applicable for microinverter installations)*

### ☐ PROJECT SPECIFIC VOLTAGE & CURRENT CALCULATIONS

- ☐ \_\_\_\_\_ Operating Voltage = (number of modules in series x module voltage at Pmax)
- ☐ \_\_\_\_\_ Operating Current = (number of parallel source circuits x modules at Pmax)
- ☐ \_\_\_\_\_ Maximum System Voltage = (Voc X 1.21 (per temp. adjust. NEC 690.7) X number of modules in series)
- ☐ \_\_\_\_\_ Short Circuit Current = (Isc X 1.25 X number of parallel source circuits)

## WIRING & OVERCURRENT PROTECTION

- ☐ Wire type is 90 degree C & suitable for wet location. NEC 100, Table 310.4(A)
- ☐ Conductor ampacities are sufficient.      ☐ Adjust ambient temperature for rooftop conduits per NEC Table 310.15(B)(1) or (2)
- ☐ Provide adjusted ampacities and calculations *(Not applicable for microinverter installations)*
  - ☐ \_\_\_\_\_ Maximum PV source circuit current (Isc X 1.25)
  - ☐ \_\_\_\_\_ Maximum PV source circuit conductor ampacity (Isc X 1.25 X 1.25)
  - ☐ \_\_\_\_\_ Maximum PV output circuit conductor ampacity (Isc X 1.25 X 1.25 X # of parallel source circuits)
  - ☐ \_\_\_\_\_ Minimum inverter output circuit conductor ampacity (inverter output in Watts divided by minimum operating voltage x 1.25 = minimum inverter output ampacity)
- ☐ Source circuit overcurrent protection sufficient
- ☐ Overcurrent protection provided with 3 or more parallel strings
- ☐ Overcurrent protection on Inverter Output Circuit is sufficient
- ☐ PV system point of connection complies with **NEC 705.11 (A-E) Supply Side or 705.12 (A-E) Load Side requirements**  
*Modifications are not to be made to electrical equipment unless approved by the manufacturer – i.e. tapping of bus bars)*
- ☐ **Supply Side Connection.** Method of Supply Side Connection \_\_\_\_\_
- ☐ **Load Side Connection.** Method of Load Side Connection \_\_\_\_\_
  - ☐ \_\_\_\_\_ Electrical service panel buss bar rating      ☐ PV breaker same manufacturer as the electrical panel
  - ☐ Circuit breaker(s) suitable for backfeed applications are in use
  - ☐ Total rating of overcurrent devices supplying power (main + PV breaker) max 125% of rating per NEC 690.9(B)
- ☐ Bonding fittings used with metal conduit for ac components per NEC 250.92 and dc components per NEC 250.97
- ☐ Expansion fittings used with rigid PVC conduit installations per NEC 352.44 & Table 352.44
- ☐ Ampacity adjustments taken for more than 3 current carrying conductors in conduits per NEC Table 310.15(c)(1)

## LABEL & MARKING REQUIREMENTS

- ☐ Labels shall be made of sufficient durability to withstand the environments involved per NEC 110.21
- ☐ Labels/markings shall be permanently affixed to or adjacent to the equipment it is identifying
- ☐ Label/Marking Requirements: *(check all boxes that apply to your installation)*
  - ☐ Ground-Fault Protection and Interruption label on utility interactive inverter per NEC 705.11(E)
  - ☐ Electric Shock Hazard label at disconnecting means per NEC 690.13(B)
  - ☐ Wiring Methods and Enclosures that contain PV source conductors per NEC 690.31(D)(2)
  - ☐ DC Junction/Combiner/Disconnect labels per NEC 690.53
  - ☐ Modules shall be marked per NEC 690.51
  - ☐ DC Power Source labeling at the DC disconnect per NEC 690.53
  - ☐ Identify maximum ac operating current & operating ac voltage at ac disconnect per NEC 690.54
  - ☐ Rapid Shutdown of PV Systems on Building Identification per NEC 690.12, 690.56(B)&(C)
  - ☐ Identify remote locations of utility & PV disconnects - permanent plaque/directory location of each source NEC 705.10
  - ☐ Distribution equipment warning label per NEC 705.12(B)(3)(3)
- ☐ **General Requirements:** All equipment installations to be provided with working space clearances per NEC Section 110.26. Maintain no less than 30 wide x 36 deep working spaces about all electrical equipment.

Signature of: **Owner/Contractor** \_\_\_\_\_ **Print Name** \_\_\_\_\_ **Date** \_\_\_\_\_